11.3.2.23. [Intentionally deleted.]

11.3.2.24. [Intentionally deleted.]

11.3.2.24.1. [Intentionally deleted.]

11.3.2.24.2. [Intentionally deleted.]

11.3.2.24.3. [Intentionally deleted.]

11.3.2.24.4. [Intentionally deleted.]

11.3.2.24.5. [Intentionally deleted.]

11.3.2.24.6. [Intentionally deleted.]

11.3.2.24.6.1. [Intentionally deleted.]

11.3.2.24.6.2. [Intentionally deleted.]

11.3.2.24.6.3. [Intentionally deleted.]

11.3.3. **LIDB Interface References** (subject to Section 23.19 of the General Terms and Conditions of this Agreement): GTE shall offer LIDB in accordance with the references of this Subsection.

11.3.3.1. The interface to LIDB shall be in accordance with the technical reference listed in Appendix A to this Attachment 2, at paragraph 10.3.

11.3.3.2. The CCS interface to LIDB shall be the standard interface listed in Appendix A to this Attachment 2, at paragraph 10.3.

11.3.3.3. The LIDB Data Base interpretation of the ANSI-TCAP messages shall comply with the technical reference listed in Appendix A to this Attachment 2, at paragraph 10.4. Global Title Translation shall be maintained in the signaling network in order to support signaling network routing to the LIDB.

11.4. **Toll Free Number Database**

The Toll Free Number Database is a SCP that provides functionality necessary for toll free (e.g., 800 and 888) number services by providing routing information and additional so-called vertical features during call set-up in response to queries from

SSPs. GTE shall provide the Toll Free Number Database in accordance with the following:

11.4.1. Technical References (subject to Section 23.19 of the General Terms and Conditions of this Agreement):

11.4.1.1. GTE shall make the GTE Toll Free Number Database available for AT&T to query with a toll-free number and originating information.

11.4.1.2. The Toll Free Number Database shall return carrier identification and, where applicable, the queried toll free number, translated numbers and instructions as it would in response to a query from a GTE switch.

11.4.2. Signaling Interface References (subject to Section 23.19 of the General Terms and Conditions of this Agreement):

The signaling interface between the AT&T or other local switch and the Toll-Free Number database shall use the TCAP protocol as specified in the technical reference listed in Appendix A to this Attachment 2, at paragraph 10.1, together with the signaling network interface as specified in the technical reference listed in Appendix A to this Attachment 2, at paragraphs 10.2. and 10.6.

11.5. **Automatic Location Identification/Data Management System (ALI/DMS)**

11.5.1. The ALI/DMS Database contains customer information (including name, address, telephone information, and sometimes special information from the local service provider or customer) used to determine to which Public Safety Answering Point (PSAP) to route the call. The ALI/DMS database is used to provide more routing flexibility for E911 calls than Basic 911.

11.6. **Technical References** (subject to Section 23.19 of the General Terms and Conditions of this Agreement): GTE shall provision the Automatic Location Identification/Data Management System (ALI/DMS) and shall provide to AT&T the associated functions and capabilities of that system at the same level of quality as GTE provides to itself.

11.6.1. GTE may provide the Emergency Services Data Base in accordance with the following: GTE may offer AT&T a data link to the port connection for the ALI/DMS database or permit AT&T to provide its own data link to the port connection for the ALI/DMS

database to AT&T immediately after AT&T inputs information into the ALI/DMS database. Alternatively, AT&T may utilize GTE to enter customer information into the database on a demand basis, and validate customer information on a demand basis.

11.6.2. The ALI/DMS database shall where Currently Available, contain the following customer information:

11.6.2.1. Name;

11.6.2.2. Address;

11.6.2.3. Telephone number; and

11.6.2.4. Other information as appropriate (e.g., whether a customer is blind or deaf or has another disability).

11.6.2.5. When GTE is responsible for administering the ALI/DMS database in its entirety, ported number NXXs entries for the ported numbers should be maintained and updated appropriately.

11.6.2.6. When Remote Call Forwarding (RCF) is used to provide number portability to the local customer and a remark or other appropriate field information is available in the database, the shadow or "forwarded-to" number sent from AT&T to GTE and an indication that the number is ported shall be added to the customer record.

11.6.2.7. If GTE is responsible for configuring PSAP features (for cases when the PSAP or GTE supports an ISDN interface) the Parties shall work together to ensure that CLASS Automatic Recall (Call Return) is not used to call back to the ported number.

11.6.2.8. [Intentionally deleted.]

11.6.3. SCPs/Databases shall meet or exceed the references for SCPs/Databases set forth in the technical references listed in Appendix A to this Attachment 2, under paragraph 10.

11.7. Service Creation Environment and Service Management System (SCE/SMS) Advanced Intelligent Network (AIN) Access

11.7.1. Advanced Intelligent Network (AIN) Database. AT&T shall have the right to obtain access to and to use GTE's service applications in the GTE SMS in addition to AT&T's own service applications that AT&T deploys via the GTE SMS to the GTE SCP, as required

below. AT&T may use and access such service applications either through AT&T Switch(es) to the GTE AIN SCP via interconnection of the GTE SS7 and AT&T SS7 networks or through its purchase of unbundled elements, including local switching, from GTE. When AT&T obtains access to GTE's service applications using an AT&T switch, this interconnection arrangement shall result in the GTE AIN SCP recognizing the AT&T Switch as at least at parity with GTE's Local Switch in terms of interfaces, performance and capabilities.

11.7.1.1. GTE STPs shall maintain global title translations necessary to direct AIN queries for select global title address and translation type values to and from the AT&T SS7 network, within the global title translation capacity to the STP.

11.7.1.2. Requirements for billing and recording information to track AIN query-response usage shall be consistent with Connectivity Billing and Recording requirements as specified in Attachment 6 (e.g., recorded message format and content, timeliness of feed, data format and transmission medium).

11.7.1.3. GTE shall provide to AT&T all necessary testing resources and staff to perform service certification testing prior to service deployment in accordance with the Cooperative Testing section of this Agreement.

11.7.1.4. [Intentionally deleted]

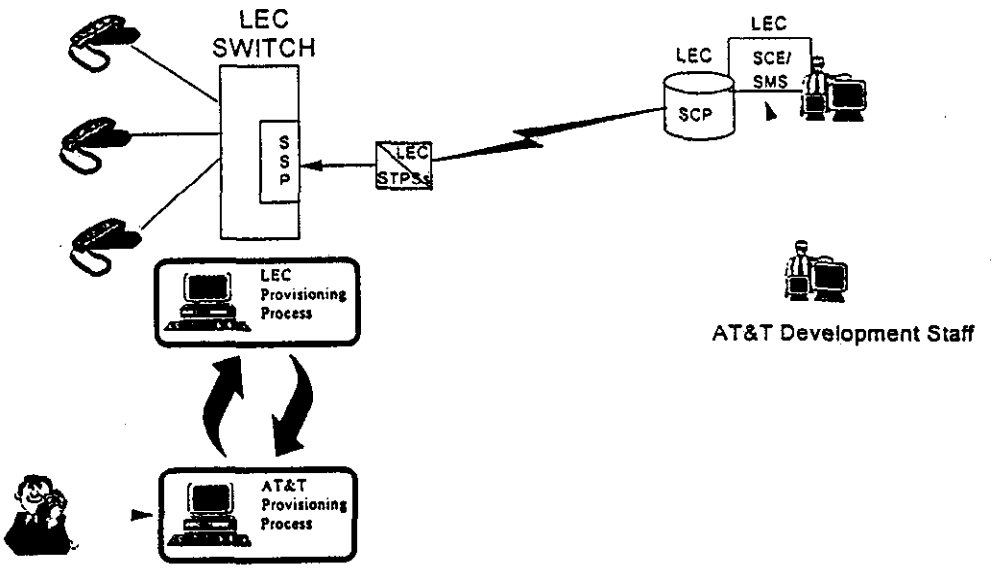
11.7.1.5. When AT&T selects SS7 Access, GTE will provide interconnection of its SS7 network per Section 10 of this Attachment 2 with AT&T's SS7 network for exchange of AIN TCAP messages between AT&T's SSP and GTE's AIN SCP.

11.7.1.6. STPs shall offer SS7 AIN Access in accordance with the technical references listed in Appendix A to this Attachment 2, under paragraph 11.

11.7.2. SCE/SMS AIN Access shall provide AT&T the ability to create service applications in the GTE SCE and deploy those applications via the GTE SMS to the GTE SCP. This interconnection arrangement shall provide AT&T access to the GTE development environment and administrative system in a manner at least at parity with GTE's ability to deliver its own AIN-based services, subject to reasonable security arrangements. SCE/SMS AIN Access is the development of service applications within the GTE

Service Creation Environment, and deployment of service applications via the GTE Service Management System. AT&T requests to use the GTE SCE will be subject to request, review and testing procedures to be agreed upon by the Parties. See Figure 2 below.

FIGURE 2



11.7.2.1. GTE shall make SCE hardware, software, testing and technical support (e.g., technical contacts, system administrator) resources available to AT&T. Scheduling of SCE resources shall allow AT&T at least equal priority to GTE.

11.7.2.2. The GTE SCE/SMS shall allow for multi-user access with proper source code management and other logical security functions as specified in the Security section of this Agreement.

11.7.2.3. The GTE SCP shall partition and protect AT&T service logic and data from unauthorized access, execution or other types of compromise.

11.7.2.4. GTE shall provide training and documentation for AT&T development staff only in cases in which such training or documentation is not reasonably available from another source. If training or documentation is required in accordance with this

section, it will be provided in a manner at least at parity with that provided by GTE to its development staff. Training will be conducted at a mutually agreed upon location provided that AT&T shall reimburse GTE for the cost of providing such resources.

11.7.2.5. When AT&T selects SCE/SMS AIN Access, GTE shall provide for a secure, controlled access environment on-site, and, if Currently Available, via remote data connections (e.g., dial up, LAN, WAN).

11.7.2.6. When AT&T selects SCE/SMS AIN Access, GTE shall allow AT&T to download data forms and/or tables to GTE SCP via GTE SMS without intervention from GTE (e.g., customer subscription).

11.7.2.7. Service Control Points (SCP)/Databases shall offer SCE/SMS AIN Access in accordance with requirements of GR-1280-CORE, AIN SCP Generic Requirements.

11.7.3. Any mediation to GTE's AIN database that GTE decides to apply, including the application of network management controls determined by GTE to be necessary to protect the SCP from an overload condition, will be done in a competitively neutral and nondiscriminatory basis for all users of the AIN database, including GTE and its customers. For example, any load mediation will affect all links to the STP, including those of GTE or its customers, in a like manner. AT&T agrees to provide forecast information of its AIN requirements sufficient to permit GTE to engineer sufficient capacity on GTE's AIN SCP platform.

12. **Tandem Switching**

12.1. **Definition:**
Tandem Switching is the function that establishes a communications path between two switching offices through a third switching office (the tandem switch).

12.2. **Technical References** (subject to Section 23.19 of the General Terms and Conditions of this Agreement): GTE shall provide Tandem Switching capabilities where Currently Available and at the same level of quality as GTE provides in its own network, for example:

12.2.1. Signaling to establish a tandem connection;

12.2.2. Screening and routing;

12.2.3. Recording of all billable events;

12.2.4. Connectivity to Operator Systems;

12.2.5. Access to Toll Free number portability database;

12.2.6. All trunk interconnections discussed under the "Network Interconnection" section (e.g., SS7, MF, DTMF, DialPulse, PRI-ISDN, DID, and CAMA-ANI (if appropriate for 911));

12.2.7. Connectivity to PSAPs where 911 solutions are deployed and the tandem is used for 911; and

12.2.8. Connectivity to transit traffic to and from other carriers.

12.2.9. Acceptance of connections (including the necessary signaling and trunking interconnections) between end offices, other tandems, IECs, ICOs, CAPs and CLEC switches.

12.2.10. Local tandeming functionality between two end offices including two offices belonging to different CLEC's (e.g., between an AT&T end office and the end office of another CLEC that subtends that tandem).

12.2.11. Preservation of CLASS/LASS features and Caller ID as traffic is processed. Additional signaling information and references are provided in Section 10.

12.2.12. Billing requirements are specified in Attachment 6 of this Agreement.

12.2.13. GTE shall perform routine testing and fault isolation on the underlying switch that is providing Tandem Switching and all its interconnections to the extent such testing and fault isolation is Currently Available. When requested by AT&T, and where Currently Available, the results and reports of the testing shall be made available to AT&T. If AT&T requests testing and fault isolation which GTE does not provide for itself, GTE may agree to perform such testing. If GTE agrees to perform such higher quality testing, GTE shall be entitled to recover costs associated therewith to the extent that such costs are not otherwise included in the cost of the element.

12.2.14. GTE shall maintain AT&T's trunks and interconnections associated with Tandem Switching at least at parity to its own trunks and interconnections.

12.2.15. Upon AT&T's request, GTE shall provide to AT&T readily available industry standard reports regarding AT&T traffic characteristics that are generated by the tandem switches performing Tandem Switching purchased by AT&T to the extent GTE has the ability to segregate such information. For local and LEC carried intraLATA toll traffic, GTE shall provide Bellcore EMR industry standard formated records. For interexchange carrier interLATA and intraLATA traffic, GTE shall provide EMI industry standard formatted records. If AT&T desires additional available information beyond that contained in industry standard reports, the Parties shall work together to satisfy AT&T's requirements to the extent GTE is obligated to meet such requirements under Applicable Law.

12.2.16. Tandem Switching shall control congestion using, for example, capabilities such as Automatic Congestion Control and Network Routing Overflow. Congestion control provided or imposed on AT&T traffic shall be at parity with controls being provided or imposed on GTE traffic (e.g., GTE shall not block AT&T traffic and leave its traffic unaffected or less affected).

12.2.17. Tandem Switching shall route AT&T calls to the GTE or AT&T endpoints or platforms (e.g., operator services and PSAPs) as designated by AT&T for each type of call. AT&T shall pay all costs associated therewith to the extent that such costs are not otherwise included in the cost of the element. Detailed primary and overflow routing plans for all AT&T interfaces, including AT&T traffic on GTE shared trunk groups, available within the GTE switching network shall be mutually agreed to by AT&T and GTE.

12.2.18. Tandem Switching shall process originating toll-free traffic received from an AT&T local switch. The Parties shall mutually agree on the methods and implementation procedures to be used to record and bill such traffic.

12.2.19. [Intentionally deleted.]

12.3. **Interface Guidelines** (subject to Section 23.19 of the General Terms and Conditions of this Agreement): GTE shall provide Interfaces for Tandem Switching at the same level of quality as GTE provides in its own network. For example:

12.3.1. Tandem Switching shall provide interconnection to the E911 PSAP where the underlying Tandem is acting as the E911 Tandem.

12.3.2. Tandem Switching shall interconnect, with direct trunks, to all carriers with which GTE interconnects.

12.3.3. GTE shall provide to the extent Currently Available, all signaling necessary to provide Tandem Switching with no loss of feature functionality.

12.3.4. Tandem Switching shall interconnect with AT&T's switch, using two-way trunks, for traffic that is transiting via the GTE network to interLATA or intraLATA carriers. GTE shall record tandem switching events necessary for GTE to bill AT&T for tandem switching and any applicable transport.

12.3.4.1. Notwithstanding Section 12.3.4 of this Attachment, where GTE's Tandems do not customarily record tandem switching events, the Parties shall jointly develop acceptable methods of tracking and billing for tandem switching.

12.3.5. At AT&T's request, Tandem Switching shall provide overflow routing of traffic from a given trunk group or groups onto another trunk group or groups according to the methodology upon which the Parties agree.

12.3.6. Subject to Section 23.19 of the General Terms and Conditions of this Agreement, Tandem Switching shall adhere to the Trunk Interface References provided in the "Network Interconnection" section.

12.4. Tandem Switching shall meet or exceed each of the technical references listed in Appendix A to this Attachment 2, under paragraph 12.

13. **Additional References** (subject to Section 23.19 of the General Terms and Conditions of this Agreement):

This Section 13 of Attachment 2 sets forth additional references for unbundled Network Elements offered to AT&T under this

Agreement.

13.1. **Cooperative Testing**

13.1.1. Definition:
Cooperative Testing means that the Parties shall cooperate with each other upon request or as needed to (1) ensure that any Network Elements provided to AT&T by GTE under this Agreement are in compliance with the requirements of this Agreement, (2) test the overall functionality of Network Elements provided by GTE to AT&T under this Agreement, and (3) ensure that all operational interfaces and processes are in place and functioning properly and efficiently for the provisioning and maintenance of Network Elements so that all appropriate billing data can be provided to AT&T.

13.1.2. References

Subject to and in conjunction with Section 23.19 of the General Terms and Conditions of this Agreement, AT&T and GTE will agree upon a process to resolve technical issues relating to interconnection of AT&T's network to GTE's network and Network Elements and Ancillary Functions. The agreed upon process shall include procedures for escalating disputes and unresolved issues up through higher levels of each company's management. If AT&T and GTE do not reach agreement on such a process within sixty (60) days of the commencement of negotiations, upon thirty (30) days notice to the other Party, a Party may submit any issues that have not been resolved by the Parties with respect to such process to the ADR procedures set forth in Section 15 and Attachment 1 of this Agreement unless both Parties agree to extend the time to reach agreement on such issues.

13.1.2.1. GTE will provision, test, and restore any Network Element that GTE provides to AT&T pursuant to this Agreement, in the same manner and to the same extent as GTE provisions, tests and restores such network elements in GTE's network that provide the same or similar functions and capabilities, and are located in similar central office conditions (e.g., central office or route) as the Network Elements provided to AT&T pursuant to this Agreement.

At AT&T's request, GTE will provide access to Network Elements provided pursuant to this Agreement sufficient for AT&T to test the performance of such Network Element(s) to AT&T's satisfaction, provided, however, GTE shall not be required to provide access

where provision of such access would raise or create reasonable network security concerns. In cases where GTE does not allow AT&T access to the Network Element, GTE shall make other arrangements to provide AT&T with test data as the Parties mutually agree.

GTE shall provide AT&T access for testing at the MDF. Such test access shall be sufficient to ensure that the applicable requirements can be tested by AT&T. This access shall be available seven (7) days per week, 24 hours per day.

[*Combinations*]

13.1.2.2. AT&T may test any interfaces, Network Elements or Ancillary Functions and additional requirements provided by GTE pursuant to this Agreement.

13.1.2.3. Subject to Section 23.19 of the General Terms and Conditions of this Agreement, GTE shall provide engineering data as requested by AT&T for the loop components as set forth in Sections 2 and 3 of this Attachment which AT&T may desire to test. Such data shall include equipment engineering and cable specifications, signaling and transmission path data. GTE shall provide to AT&T the same type and quality of loop testing information that it provides to itself. Where GTE develops loop testing information as a matter of course, it will make that information available to AT&T where such information is relevant to AT&T's business. Where GTE maintains the internal discretion to test loops as needed, GTE will provide similar testing discretion to AT&T.

13.1.2.4. [Intentionally Deleted]

13.1.2.5. [Intentionally Deleted]

13.1.2.6. GTE shall temporarily provision selected Local Switching features for testing. Where applicable, rates and charges for unbundled ports and features, including but not limited to monthly rates, usage rates and nonrecurring charges, shall apply for the duration of such tests. Within 60 days of the Effective Date of this Agreement AT&T and GTE shall mutually agree on the procedures to be established between GTE and AT&T to expedite such provisioning processes for feature testing.

13.1.2.7. Upon AT&T's request, GTE shall provide technical staff to meet with AT&T representatives to provide required support for Cooperative Testing.

13.1.2.8. Dedicated Transport and Loop Feeder may experience alarm conditions due to in-progress tests. GTE shall not remove such facilities from service without obtaining AT&T's prior approval.

13.1.2.9. GTE shall conduct tests or maintenance procedures on Network Elements or Ancillary Functions or on the underlying equipment that is then providing a Network Element or Ancillary Function, that may cause a service interruption or degradation if such tests and procedures are at a time that is mutually acceptable to AT&T and GTE.

13.1.2.10. GTE shall provide a single point of contact to AT&T that is available 7 days per week, 24 hours per day for trouble status, sectionalization, resolution, escalation, and closure. Such staff shall be adequately skilled to allow expeditious problem resolution.

13.1.2.11. [Intentionally Deleted]

13.1.2.12. GTE shall participate in Cooperative Testing with AT&T upon AT&T's request to test any operational interface or process used to provide any Network Elements to AT&T.

13.1.2.13. AT&T and GTE shall endeavor to complete Cooperative Testing expeditiously.

13.1.2.14. During Cooperative Testing, GTE provisioning processes may, at GTE's sound discretion, be enhanced to deliver Network Elements to AT&T in shorter intervals than during subsequent normal service periods upon development of a rate for premium service provisioning.

13.1.2.15. GTE shall participate in Cooperative Testing requested by AT&T as mutually required to insure service performance, reliability and customer serviceability of a Network Element.

13.1.2.16. AT&T may accept or reject the Network Element ordered by AT&T if upon completion of cooperative acceptance testing, the tested Network Element does not, subject to Section 23.19 of the General Terms and Conditions of this Agreement, meet the appropriate technical or performance requirements for such Network Element.

13.2. **Performance References** (subject to Section 23.19 of the General Terms and Conditions of this Agreement):

13.2.1. Scope:

This section addresses performance references for Network Elements and Ancillary Functions to provide local service. It includes references for the reliability and availability of Network Elements and Ancillary Functions, and examples of quality parameters such as transmission quality (analog and digital), and speed (or delay) that serve as a reference to the Parties in providing services pursuant to this Agreement. In addition, an overview of service performance references is given.

13.2.1.1. The General Performance References in this section apply to all aspects of Network Elements and Ancillary Functions. Additional references are given in this performance section and in the individual Network Elements sections.

13.2.1.2. GTE shall work cooperatively with AT&T to determine appropriate performance allocations across Network Elements.

13.2.2. Subject to Section 23.19 of the General Terms and Conditions of this Agreement, GTE shall meet or exceed the performance standards and references set forth in the technical references listed in Appendix A to this Attachment 2, under paragraph 13.

13.2.3. Services and Capabilities

13.2.3.1. Network Elements provided to AT&T pursuant to this Agreement shall provide services and capabilities consistent with Section 11.2 of the General Terms and Conditions of this Agreement. GTE shall not intentionally impair or degrade the services and capabilities of any Network Element(s) provided to AT&T pursuant to this Agreement.

13.2.3.1.1. [Intentionally deleted.]

13.2.3.1.2. [Intentionally deleted.]

13.2.3.1.3. [Intentionally deleted.]

13.2.3.1.4. [Intentionally deleted.]

13.2.3.1.5. [Intentionally deleted.]

13.2.3.2. [Intentionally deleted.]

13.2.3.2.1. [Intentionally deleted.]

13.2.3.2.2. [Intentionally deleted.]

13.2.3.2.3. [Intentionally deleted.]

13.2.3.2.4. [Intentionally deleted.]

13.2.3.2.5. [Intentionally deleted.]

13.2.3.2.6. [Intentionally deleted.]

13.2.3.2.7. [Intentionally deleted.]

13.2.4. Specific Technical References for Network Elements (subject to Section 23.19 of the General Terms and Conditions of this Agreement):

13.2.4.1. The following sections 13.2.4.2 through 13.2.4.5.6.2.9.2 describe technical references and performance parameters for Network Elements and Ancillary Functions. The technical references and performance parameters listed in the following sections shall be subject to and interpreted in conjunction with Section 23.19 of the General Terms and Conditions of this Agreement such that failure by GTE to meet any of the technical criteria or performance parameters listed in such sections shall not constitute a breach of contract by GTE. Notwithstanding the above, nothing in this section shall remove or release GTE from its obligations under Section 11.2 of the General Terms and Conditions of this Agreement.

13.2.4.2. Performance Allocation Transmission path impairments may be classified as either analog or digital, and will depend on the nature of the signal transmitted across the Network Element. Analog impairments are introduced on any analog portion of the loop, typically between the NID portion of Loop Distribution and the analog to digital (A/D) conversion, and are usually correlated with the length of the physical plant. Digital impairments are introduced by A/D conversion and by interfaces between digital Network Elements. In addition, noise can be introduced by either analog transmission or the A/D conversion.

13.2.4.3. Loop Architecture Parameters

13.2.4.3.1. The following parameters apply to the entire path between the NID and the GTE switch.

13.2.4.3.1.1. No more than 1 A-D conversion.

13.2.4.3.1.2. No more than 1, 2-to-4-wire hybrid.

13.2.4.3.1.3. No voice compression.

13.2.4.3.1.4. No echo cancelers or suppressers.

13.2.4.3.1.5. One digital loss pad per PBX.

13.2.4.3.1.6. No digital gain.

13.2.4.3.1.7. No additional equipment that might significantly increase intermodulation distortion.

13.2.4.4. Transmission Impairments

13.2.4.4.1. Analog Impairments Analog impairments are those introduced on portions of the end-to-end circuit on which communications signals are transmitted in analog format. These portions of the transmission path would typically be between NID and an A/D conversion, most commonly on the metallic loop. The performance on the analog portion of a circuit is typically inversely proportional to the length of that circuit.

13.2.4.4.1.1. Loss

13.2.4.4.1.1.1. Electrical loss is measured using a 1004 Hz 0.0dB one Milliwatt 900 ohm test tone.

13.2.4.4.1.1.2. Off-hook electrical loss between the NID and the switch shall be no more than 8.0 dB for any line, and the mean value for all lines shall be 3.5 dB ±0.5 dB. On-hook electrical loss between the NID and the switch shall be no more than 4.0 dB above the off-hook electrical loss for any line.

13.2.4.4.1.2. Idle Channel Circuit Noise

13.2.4.4.1.2.1. Idle channel circuit noise (C-message) is added by analog facilities, by the A/D conversion of signals, by digital processing equipment

(e.g. echo cancelers, digital loss pads), robbed bit signaling, and errors on digital facilities.

13.2.4.4.1.2.2. Idle channel circuit noise shall be less than or equal to 18 dBrnC.

13.2.4.4.1.3. Talker Echo

13.2.4.4.1.3.1. The primary source of echo is improper impedance-matching at the 2-to-4 wire hybrid in the GTE network. The impact on customer perception is a function of both echo return loss and delay.

13.2.4.4.1.3.2. Echo Return Loss (ERL) shall be greater than 26dB to a standard termination (900 ohms, 2.16 mFd), and greater than 14 dB to a telephone set off-hook. Singing Return Loss (SRL) shall be greater than 21dB to a standard termination, and greater than 11 dB to a telephone set off-hook.

13.2.4.4.1.4. Listener Echo

Listener echo is a double reflection of a transmitted signal at two different impedance mismatches in the end-to-end connection. While in extreme cases it can degrade voice transmission performance, listener echo is primarily an issue for voiceband data. The requirements on Talker Echo shall apply to Listener Echo.

13.2.4.4.1.5. Propagation and Processing Delay

13.2.4.4.1.5.1. Propagation delay is the delay involved in transmitting information from one location to another. It is caused by processing delays of equipment in the network and delays associated with traveling across transmission facilities.

13.2.4.4.1.5.2. GTE shall cooperate with AT&T to limit total service propagation and processing delay to levels at parity with that within the GTE local network.

13.2.4.4.1.6. Signal-to-Noise Ratio

13.2.4.4.1.6.1. The Signal-to-Noise Ratio (S/N) is a critical parameter in determining voiceband data performance. It is typically measured with a 1004 Hz tone.

13.2.4.4.1.6.2. GTE must provide on the Loop a signal-to-noise ratio of at least 37 dB between the NID and the end office.

13.2.4.4.1.7. C-Notched Noise

The requirements for Signal-to-Noise Ration shall apply to C-

Notched Noise.

13.2.4.4.1.8. Attenuation Distortion

13.2.4.4.1.8.1. Attenuation distortion, also known as frequency distortion or gain slope, measures the variations in loss at different frequencies across the voice frequency spectrum (200 Hz - 3400 Hz). It is measured by subtracting the loss at 1004 Hz from the loss at the frequency of interest.

13.2.4.4.1.8.2. Attenuation distortion from the NID to the switch shall be within the range ± 0.5 dB for frequencies between 304 and 3004 Hz; from the switch to NID attenuation distortion shall be within the range ± 0.5 dB for frequencies between 204 Hz and 3004 Hz. In addition, attenuation distortion shall remain within the range +1dB/-3dB for frequencies between 200 Hz and 3500 Hz.

13.2.4.4.1.9. Envelope Delay Distortion

13.2.4.4.1.9.1. Envelope Delay Distortion (EDD) measures the difference in transit time of signals at different frequencies. EDD is measured relative to the transit time of a 1704 Hz. tone, and is given in microseconds. EDD is used as an approximation of the group delay of the channel.

13.2.4.4.1.9.2. EDD shall be: 1704 Hz to 604 Hz -- $\leq$ 350 msec.; 1704 Hz to 2804 Hz -- $\leq$ 195 msec.; 1704 Hz to 204 Hz -- $\leq$ 580 msec.; 1704 Hz to 3404 Hz -- $\leq$ 400 msec.

13.2.4.4.1.10. Phase Jitter

13.2.4.4.1.10.1. Phase jitter measures the unwanted angular modulation of a signal. It is caused by noise or the actual modulation of the signal by another unwanted signal. It displaces the zero crossings of a signal. It is measured in terms of peak-to-peak deviations of a 1004 Hz. tone from its nominal zero crossings, and in a particular frequency band (20-300 Hz and either 4-300 Hz or 2-300 Hz). Phase jitter impacts voiceband data performance and can make modems more susceptible to other impairments, including noise.

13.2.4.4.1.10.2. From the NID to the interexchange carrier point of termination, phase jitter shall be <1.5 ° point-to-point in the 20-300 Hz band, and <1.8° point-to-point in the 4-300 Hz. band.

13.2.4.4.1.11. Amplitude Jitter

13.2.4.4.1.11.1. Amplitude jitter is any deviation of the peak value of a 1004 Hz signal from its nominal value. Excessive amounts can impair voiceband data performance. It is primarily caused by noise but can also be caused by phase jitter, gain hits, or single frequency interference.

13.2.4.4.1.11.2. In NID-interexchange carrier point of termination, $\leq$2.5% of amplitude jitter is permitted in the 20-300 Hz band and $\leq$2.9% in the 4-300 Hz band.

13.2.4.4.1.12. Intermodulation Distortion

13.2.4.4.1.12.1. Intermodulation distortion (IMD) measures non-linear distortions of a signal. It compares the power of harmonic tones to the power of the transmitted tones. It is measured for both the 2nd and 3rd harmonics of the transmitted tones. IMD is caused by compression or clipping and can impair voiceband data performance.

Both 2nd and 3rd order IMD between the NID and end office must be $\geq$ 52dB.

13.2.4.4.1.13. Impulse Noise

13.2.4.4.1.13.1. Impulse noise is a sudden and large increase in noise on a channel for a short duration of time. Impulse noise is measured as a count of the number of times a noise threshold is exceeded during a given time period (typically 5 or 15 minutes). It is caused by protection switching, maintenance activities, electromechanical switching systems, digital transmission errors, and line coding mismatches. Impulse noise sounds like clicking noises or static on voice connections. Impulse noise impairs voiceband data performance.

13.2.4.4.1.13.2. The NID to interexchange carrier point of termination portions of connections shall introduce no impulse noise events within 6dB of the received signal power on 93% of all 15 minute connections. In addition, there shall be no more than 1 impulse noise event within 6 dB of the received signal power during any 30-minute period.

13.2.4.4.1.14. Phase Hits

13.2.4.4.1.14.1. Phase hits are a sudden change in the phase of a signal lasting at least 4 msec. Phase hits are measured using a threshold which indicates how much the phase of the signal has changed with respect to its nominal phase. Phase hits are caused by protection

switching and slips or other synchronization errors. Phase hits can impair voiceband data performance.

13.2.4.4.1.14.2. Between the NID and interexchange carrier point of termination, 99.75% of all 15-minute connections shall have no phase hits exceeding 10°. In addition, there shall be no more than 1 phase hit exceeding 10° in any 30-minute period.

13.2.4.4.1.15. Gain Hits

13.2.4.4.1.15.1. Gain hits are sudden changes in the level of a signal that last at least 4 msec. Gain hits are measured against a threshold of typically 2-5 dB relative to the signal's nominal level. Gain hits are usually caused by protection switches and can impair voiceband data performance.

13.2.4.4.1.15.2. Between the NID and the interexchange carrier point of termination, 99.5% of all 15-minute connections shall have no gain hits exceeding 3 dB. In addition, there shall be no more than 1 gain hit exceeding 3 dB in any 30-minute period.

13.2.4.4.1.16. Dropouts

13.2.4.4.1.16.1. Dropouts are drops in the level of a signal of 12 dB or more for at least 4 msec. They are caused by protection switching events, radio fading, and conditions causing digital carrier systems to lose frame. Dropouts are critical for voiceband data performance but, if severe enough, will also affect voice quality.

13.2.4.4.1.16.2. Between the NID and the interexchange carrier point of termination, 99.9% of all 15-minute connections shall have no dropouts and in addition, no connection shall suffer more than 1 dropout in any 60-minute period.

13.2.4.4.1.17. Frequency Shift

13.2.4.4.1.17.1. Frequency shift measures any frequency changes that occur when a signal is transmitted across a channel. It is typical measured using a 1004 Hz tone. Frequency shift has very little impact on voice or voiceband data performance; however, round-trip frequency shifts can affect the ability of echo cancelers to remain converged.

13.2.4.4.1.17.2. No more than 0.2 Hz frequency shift shall be on any connection. In addition, 99.5% of all calls shall have frequency shift < 0.1 Hz.

13.2.4.4.1.18. Crosstalk

13.2.4.4.1.18.1. Crosstalk is the presence of signals from other telephone connections on a circuit. Crosstalk can be either intelligible, when speech from other connections can be heard and understood, or unintelligible. Crosstalk is caused by inter-channel interference on the transmission system. Crosstalk is difficult to measure: it requires correlating signals on different circuits or using human listeners to identify its presence. Trouble reports may be used to estimate the probability of crosstalk.

13.2.4.4.1.18.2. 99% of Loop(s) shall have probability $\leq$ 0.1% of experiencing crosstalk exceeding -65 dBm0.

13.2.4.4.1.19. Clipping

13.2.4.4.1.19.1. Clipping occurs when part of a transmitted signal is dropped and does not reach the receiving portion on a connection. It can be caused by Digital Speech Interpolation (DSI) equipment used in Digital Circuit Multiplication Systems (DCMS) which increase the amount of traffic that transmission facilities carry, and by echo cancelers or echo suppressers.

No clipping incidents shall occur on any call.

13.2.4.4.2. Digital Impairments

Digital impairments occur in the signal wherever it is transmitted in digital format. These errors are usually introduced upon conversion of the signal from analog to digital, as well as at interfaces between digital components. While many digital impairments have little impact on subjective voice quality, they can impact voiceband data performance.

13.2.4.4.2.1. Signal Correlated Distortion

13.2.4.4.2.1.1. Signal correlated distortion (SCD) is unwanted noise or distortion introduced into a signal through the conversion of a signal from analog to digital format or through digital processing that changes the transmitted signal. SCD affects performance when a sign is being transmitted. The primary sources of SCD are signal encoders, echo cancelers, digital loss pads, and robbed bit signaling. SCD affects both voice and voiceband data performance.

13.2.4.4.2.1.2. The NID-to-end-office connection shall allow:

13.2.4.4.2.1.2.1. A maximum of 1 A/D conversion, using 64Kbps m-law (m=255) PCM;

13.2.4.4.2.1.2.2. No voice compression;

13.2.4.4.2.1.2.3. No echo cancellation; and

13.2.4.4.2.1.2.4. Robbed bit signaling only if SS7 or ISDN are not used.

13.2.4.4.2.2. Slips

13.2.4.4.2.2.1. Slips occur when a frame of digital data is either deleted or repeated because of differences in the clocks used to synchronize digital facilities. Slips sound like clicks or pops on voice calls and have major impact on voiceband data performance.

13.2.4.4.2.2.2. The NID-to-interexchange carrier point of termination portion of connections shall have fewer than 0.45 slips every 24 hours on average.

13.2.4.4.2.3. Digital Timing Jitter and Wander

13.2.4.4.2.3.1. Digital timing jitter is the unwanted phase modulation of digital signals at rates above 10 Hz. Wander is the unwanted phase modulation of digital signals at rates below 10 Hz. Digital timing jitter is caused by imperfections in the timing recovery process of repeaters and the stuffing synchronization process used by multiplexer/demultiplexers. Wander is caused by slowly varying changes in digital signal phase due to clock frequency offset and drift, changes in propagation delay of terrestrial facilities due to temperature changes and changes in the distance of satellites from the earth. These events have a major impact on voiceband data performance.

13.2.4.4.2.3.2. The maximum digital timing jitter allowed in the 10 Hz to 8 kHz frequency band at any network interface or any terminal equipment in the network is 5 Unit Intervals (UI). The maximum digital timing jitter allowed in the 8 kHz to 40 kHz frequency band is 0.1 UI. The objective for wander is less than 28 UI at any network interface or terminal equipment.

13.2.4.4.2.4. DS-1 Errored Seconds

13.2.4.4.2.4.1. An Errored Second (ES) on a DS-1 facility is any second during which at least 1 bit is in error. The impact of an ES on performance depends on the number of errors that occur during a second.

Typically, voice performance is not significantly impacted by ES but they can cause errors in voiceband data transmissions.

13.2.4.4.2.4.2. Each GTE network shall have less than 20 ESs per 24 hour period.

13.2.4.4.2.5. DS-1 Severely Errored Seconds

13.2.4.4.2.5.1. A severely Errored Second (SES) is any second during which a DS-1 has an error rate exceeding 0.001. An SES can be caused by a loss of framing, a slip, or a protection switch. SESs have impacts on both voice and voiceband data performance. For voice, an SES will sound like a burst of noise or static. SESs that occur during a voiceband data transmission cause a significant burst of errors and can cause modems to retrain.

13.2.4.4.2.5.2. The digital portion of each NID to POP connection shall have less than 2 SESs per 24 hour period).

13.2.4.4.2.6. Short Failure Events

13.2.4.4.2.6.1. A Short Failure Event (SFE) is a Loss of Frame (LOF) event of less than two minutes' duration. An LOF event is declared when, on detection of a Loss of Signal (LOS) or Out-of-Frame (OOF), a rise-slope-type integration process starts that declares a LOF after 2.5±0.5 sec. of continuous LOS or OOF. If the LOS or OOF is intermittent, the integration process shall decay at a slope of 1/5 the rise slope during the period when the signal is normal. Thus, if the ratio of a LOS or OOF to a normal signal is greater than 1/2, a LOF will be declared. A LOS condition shall be declared when the Network Channel Terminating Equipment has determined that 175±75 successive pulse positions with no pulses of either positive or negative polarity have occurred. An OOF condition shall be declared when either Network equipment or Digital Terminal Equipment detects errors in the framing pattern.

13.2.4.4.2.6.2. There shall be fewer than 1 SFE per month.

13.2.4.5. Service Availability and Reliability

Availability refers to the time period during which the service is up and usable for its intended purpose. Reliability refers to the probability that a task will be completed successfully, given that it is successfully begun.

13.2.4.5.1. Blocked Calls

13.2.4.5.1.1. Blocking is the fraction of call origination attempts denied service during a stated measurement period. Blocking occurs because of competition for limited resources within the network.

13.2.4.5.1.2. For intraLATA toll service as well as for local exchange service, the blocking level from originating network interface (NID) to terminating NID shall not exceed 1% in any hour, except under conditions of service disruption. For access to or egress from the AT&T long distance network, the blocking rate shall not exceed 0.5% in any hour, except under conditions of service disruption.

13.2.4.5.2. Blocked Dial Tone

13.2.4.5.2.1. Blocked dial tone occurs when the subscriber does not receive dial tone within 3 seconds of going off-hook.

13.2.4.5.2.2. Customers shall not experience more than 0.1% dial tone blocking during average busy season busy hour (ABSBH).

13.2.4.5.3. Downtime

Downtime is the period of time that a system is in a failed state.

13.2.4.5.3.1. The average downtime for all subscriber Loop(s) shall be less than 49 minutes per year. The maximum downtime for 99% of all subscriber Loop(s) shall be less than 74 minutes per year.

13.2.4.5.3.2. The average downtime for an end office switch shall be less than 3 minutes per year. The average downtime for individual trunks shall be less than 28 minutes per year. The average downtime for digital trunk groups shall be less than 20 minutes per year. The average downtime for an individual line appearance at the switch shall be less than 28 minutes per year. The average downtime for a Remote Terminal (RT) shall be less than 17 minutes per year. The average downtime for an individual line on a Remote Terminal (RT) shall be less than 13 minutes per year.

13.2.4.5.3.3. [Intentionally deleted.]

13.2.4.5.3.4. There shall be no downtime due to power failures at the switch.

13.2.4.5.3.5. The probability of a stable call being cut off shall be less than 20 cutoffs per one million 1 minute calls.

13.2.4.5.3.6. The rate of ineffective machine attempts at the end office shall be less than 0.0005 (5 failures per 10,000 call attempts).

13.2.4.5.3.7. GTE shall meet all references for private line services in TR-NWT-000335, ANSI T1.512-1994, and AT&T Technical References as listed in this Section 13.2.

13.2.4.5.4. Dial Tone Delay

13.2.4.5.4.1. Dial-Tone Delay is the time period between a customer off-hook and the receipt of dial tone from an originating end office. Dial-Tone Delay has a significant effect on customer opinion of service quality.

13.2.4.5.4.2. The average dial-tone delay shall not exceed 0.6 seconds. At most 0.5% of calls during the average-season busy hour (ABSBH) shall experience dial-tone delay greater than 3 seconds. At most 8% of calls during the ten-high-day busy hour (THDBH) shall experience dial-tone delay greater than 3 seconds. At most 10% of calls during the high-day busy hour (HDBH) shall experience dial-tone delay greater than 3 seconds.

13.2.4.5.5. Dial Tone Removal

13.2.4.5.5.1. Dial tone removal is the time between recognition of the first address digit to the removal of dial tone on the line.

The maximum dial tone removal interval shall be $\leq$ 500 milliseconds.

13.2.4.5.6. Post Dial Delay

13.2.4.5.6.1. Post Dial Delay (PDD) is the amount of time a caller must wait after entering or dialing the last digit of a Destination Telephone Number (DTN) before hearing a valid audible network response. The PDD for an end user is measured from the time the caller has pressed or dialed the last digit of a DTN until receipt of an audible network response.

13.2.4.5.6.2. The references given reflect an end-to-end CCS7 protocol for AT&T end users. Where a mixture of CCS7 and inband (MF) signaling protocols are employed, an increase in the PDD can be expected.

13.2.4.5.6.2.1. PDD 1 - A - Intra AT&T LSO

13.2.4.5.6.2.1.1. Intra-LSO calls do not employ external signaling protocols. The PDD for intra-LSO calls flows are dependent upon the processor cycle time and traffic load conditions. This PDD is assumed to be between customers on the same AT&T LSO, between the Remote Switch Modules (RSMs) on the same Host, or between an RSM and 5ESS Host customers.

13.2.4.5.6.2.1.2. The objective for intra-LSO PDD is less than 310 milliseconds for 50% of all calls and less than 460 milliseconds for 95% of all calls.

13.2.4.5.6.2.2. PDD1 - B - AT&T LSO to Another AT&T Local LSO

13.2.4.5.6.2.2.1. The signaling protocols from an AT&T LSO to another AT&T LSO are assumed to employ out-of-band Common Channel Signaling System 7 (CCS7) format. Local calls, that is, calls from an AT&T LSO to another AT&T LSOs are assumed to have no more than one pair of Signaling Transfer Point Switches (STPSs) and no more than one data base dip.

13.2.4.5.6.2.2.2. This PDD is expected to be better than the AT&T Long Distance objective with an average PDD of $\leq$ .870 seconds with 95% $\leq$ 1.34 seconds.

13.2.4.5.6.2.3. PDD1 - C - AT&T LSO to Other LSO

13.2.4.5.6.2.3.1. Calls from an AT&T LSO to other LSOs are dependent upon the interface agreements between AT&T and the LSO service provider and may employ CCS7, inband (MF) or a combination of both protocols.

13.2.4.5.6.2.3.2. Calls from an AT&T LSO to another LSO via the Public Switched Telecommunications Network (PSTN), using end-to-end CCS7 signaling protocols, can expect to meet the AT&T PDD objectives of an average of 2.0 seconds with 95% in $\leq$ 2.5 seconds. Calls from an AT&T LSO via the PSTN to LSOs outside the local service area are assumed to use CCS7 signaling protocols to the AT&T #4ESS.Ô The egress signaling protocols from the AT&T Switched Network (ASN) to the many different local telephone company service providers however does not necessarily utilize CCS7 signaling. There are three basic egress signaling configuration. They are:

13.2.4.5.6.2.3.2.1. Network Inter-Connect, CCS7 between AT&T and the local telephone company.

13.2.4.5.6.2.3.2.2. Inband Multifrequency (MF) signaling protocols without a GTE egress tandem in the connection.

13.2.4.5.6.2.3.2.3. Inband MF signaling protocols with a GTE egress tandem in the connection.

13.2.4.6.3.2.3.2.3.1 Calls from an AT&T LSO to other LSOs outside the local service area are assumed to have multiple STPSs for 1+ traffic in the access and ASN portion of the connection. The egress from the ASN for 1+ traffic is again dependent upon the interface agreements in that service area and may consist of CCS7 or inband MF protocols.

13.2.4.6.3.2.3.2.3.2 Calls from an AT&T's LSO to another AT&T LSO with a mixture of CCS7 or all inband signaling protocols are expected to receive PDDs on the average of 2.9 seconds with 95% in $\leq$ 6.5 seconds.

13.2.4.5.6.2.4. PDD2 - AT&T LSO to Operator Services

13.2.4.5.6.2.4.1. The signaling protocols between an AT&T LSO and the AT&T ASN 5ESS® Operator Services Position Systems (OSPS) will employ IN-band Feature Group C Modified Operator Services Multifrequency signaling format. As with 1+ traffic, the egress from the ASN to the local service providers LSO is dependent upon the interface.

13.2.4.5.6.2.5. PDD2 - A - AT&T LSO to 5ESS® OSPS 0 Only

13.2.4.5.6.2.5.1. When a "0" has been entered by the customer, timing is applied in the absence of a DTMF "#". If a "#" is not entered, the objective is for the timer to expire in 4 seconds +/- 1 second. After the timer has expired, or the "#" has been entered, the average PDD shall not exceed 2.2 seconds.

13.2.4.5.6.2.6. PDD2 - B - 0 Plus Calls

13.2.4.5.6.2.6.1. On calls where analysis of the first 6 digits (area code + central office code) is required, the PDD shall not exceed 2.0 seconds on the average, and 2.5 seconds in 95% of all occurrences. For calls that require analysis of the 10-digits CALLED number and the 7 digits of calling number (ANI, e.g. Automatic Charge Quotation Service) the PDD is expected to be 4.5 seconds on the average and < 5.0 seconds in 95% of all occurrences. These delays are based on the calling customer receiving a network response as described above, specifically the calling card alerting tone from the 5ESS® OSPS. The remaining call completion PDD to the DTN,

after the customer has completed the Operator Service function, will take the form of the PDDs discussed in PDD1-C.

13.2.4.5.6.2.7. Impact of Local Number Portability (LNP)

13.2.4.5.6.2.7.1. Local Number Portability will increase PDDs. If a call forwarding option is used as an interim solution for LNP, the delay due to additional switching in the local access is estimated to be 0.3 seconds (mean) and 0.4 seconds (95th percentile) in addition to the PDDs described earlier. These estimates assumes CCS7 signaling between LSOs. If inband signaling is used between LSOs, the PDD will be increased by 1.9 to 3.6 (1.7+1.9) seconds compared to the PDDs provided in the section on Post Dial Delay.

13.2.4.5.6.2.8. Custom Local Area Subscriber Services (CLASS)

13.2.4.5.6.2.8.1. CLASS^{sm} features such as Calling Name Delivery can contribute to the PDD of a call. This delay is caused by the additional time (GTE option) before the ringing interval commences. This default delay is 3 seconds. Optional settings are available in 1 second intervals from 1 to 6 seconds. Calls to DTNs that have CLASS^{SM} features, particularly with calling name delivery, can expect to experience from 1 to 6 seconds (3 seconds default) of additional PDD compared to the PDDs shown for PDD1-C.

13.2.4.5.6.2.9. Partial Dial Timing

13.2.4.5.6.2.9.1. The interval between each information digit from a customer's line, until the LSO or switching system has determined that the digit string is incomplete.

13.2.4.5.6.2.9.2. For customer lines, partial dial timing shall be $\geq$ 16 seconds and $\leq$ 24 seconds. For trunks, inband signaling time-out shall be $\geq$ 5 seconds and $\leq$ 20 seconds.

13.2.5. [Intentionally deleted.]

13.2.5.1. [Intentionally deleted.]

13.2.5.1.1. [Intentionally deleted.]

13.2.5.1.2. [Intentionally deleted]

13.3. **Protection, Restoration, and Disaster Recovery**

13.3.1. Scope:

This Section refers specifically to references on the use of redundant network equipment and facilities for protection, restoration, and disaster recovery.

13.3.2. Technical References (subject to Section 23.19 of the General Terms and Conditions of this Agreement):

13.3.2.1. GTE shall provide protection, restoration, and disaster recovery capabilities at parity with those capabilities provided for GTE's own services, facilities and equipment (e.g., equivalent circuit pack protection ratios, facility protection ratios).

13.3.2.2. GTE shall provide Network Elements and Ancillary Functions equal priority in protection, restoration, and disaster recovery as provided to GTE's own services, facilities and equipment.

13.3.2.3. GTE shall provide Network Elements and Ancillary Functions equal priority in the use of spare equipment and facilities as provided to GTE's own services, facilities and equipment.

13.3.2.4. Where AT&T designates an AT&T customer priority list, GTE shall restore Network Elements provided to AT&T, which have been identified by the Parties as serving the customers on the priority list, in accordance with AT&T's priority designation. AT&T will work jointly with GTE in identifying those Network Elements associated with the priority customer list.

13.4. **Synchronization**

13.4.1. Definition:

Synchronization is the function which keeps all digital equipment in a communications network operating at the same average frequency. With respect to digital transmission, information is coded into discrete pulses. When these pulses are transmitted through a digital communications network, all synchronous Network Elements are traceable to a stable and accurate timing source. Network synchronization is accomplished by timing all synchronous Network Elements in the network to a stratum 1 traceable timing source so that transmission from these network points have the same average line rate.

13.4.2. Technical References (subject to Section 23.19 of the General Terms and Conditions of this Agreement):

The following references are applicable to the case where GTE provides synchronization to equipment that AT&T owns and operates within a GTE location. In addition, these references apply to synchronous equipment that is owned by GTE and is used to provide a Network Element to AT&T.

13.4.2.1. The synchronization of clocks within digital networks is divided into two parts: intra-building and inter-building. Within a building, a single clock is designated as the Building Integrated Timing Supply (BITS), which provides all of the DS1 and DS0 synchronization references required by other clocks in such building. This is referred to as intra-building synchronization. The BITS receives synchronization references from remotely located BITS. Synchronization of BITS between buildings is referred to as inter-building synchronization.

13.4.2.2. To implement a network synchronization plan, clocks within digital networks are divided into four stratum levels. All clocks in strata 2, 3, and 4 are synchronized to a stratum 1 clock, that is, they are traceable to a stratum 1 clock. A traceable reference is a reference that can be traced back through some number of clocks to a stratum 1 source. Clocks in different strata are distinguished by their free running accuracy or by their stability during trouble conditions such as the loss of all synchronization references.

13.4.2.2.1. Intra-Building

13.4.2.2.1.1. Within a building, there are different kinds of equipment that require synchronization at the DS1 and DS0 rates. Synchronization at the DS1 rate is accomplished by the frequency synchronizing presence of buffer stores at various DS1 transmission interfaces. Synchronization at the DS0 rate is accomplished by using a composite clock signal that phase synchronizes the clocks. Equipment requiring DS0 synchronization frequently does not have adequate buffer storage to accommodate the phase variations among different equipment. Control of phase variations to an acceptable level is accomplished by externally timing all interconnecting DS0 circuits to a single clock source and by limiting the interconnection of DS0 equipment to less than 1,500 cable feet. Therefore, a BITS shall provide DS1 and composite clock signals when appropriate The composite signal is a 64-kHz 5/8th duty cycle, return to zero with a bipolar violation every eighth pulse (B8RZ).

13.4.2.2.2. Inter-Building

13.4.2.2.2.1. Subject to Section 23.19 of the General Terms and Conditions of this Agreement, GTE shall provide inter-building synchronization at the DS1 rate, and the BITS shall accept the primary and secondary synchronization links from BITS in other buildings. From hierarchical considerations, the BITS shall be the highest stratum clock within the building and GTE shall provide operations capabilities (this includes, but is not limited to: synchronization reference provisioning; synchronization reference status inquiries; timing mode status inquiries; and alarm conditions).

13.4.3. Synchronization Distribution References (subject to Section 23.19 of the General Terms and Conditions of this Agreement):

13.4.3.1. Central office BITS shall contain redundant clocks meeting or exceeding the references for a stratum 2 clock as specified in ANSI T1.101-1994 and Bellcore TR-NWT-001244 Clocks for the Synchronized Network: Common Generic Criteria.

13.4.3.2. Central office BITS shall be powered by primary and backup power sources to the extent GTE utilizes such backup power sources in GTE's own network.

13.4.3.3. If both reference inputs to the BITS are interrupted or in a degraded mode (meaning off frequency greater than twice the minimum accuracy of the BITS, loss of frame, excessive bit errors, or in Alarm Indication Signal), then the stratum clock in the BITS where Currently Available, shall provide the necessary bridge in timing to allow the network to operate without a frame repetition or deletion (slip free) with better performance than 1 frame repetition or deletion (slip) per week.

13.4.3.4. DS1s multiplexed into a SONET synchronous payload envelope within an STS-n (where n is defined in ANSI T1.105-1995) signal shall not be used as reference facilities for network synchronization.

13.4.3.5. The total number of Network Elements cascaded from the stratum 1 source shall be minimized in accordance with GTE's standards for such minimization.

13.4.3.6. To the extent that GTE provides such stratum level to itself, a Network Element shall receive the synchronization reference signal

only from another Network Element that contains a clock of equivalent or superior quality (stratum level).

13.4.3.7. [Intentionally deleted.]

13.4.3.8. Where possible, all primary and secondary synchronization facilities shall be physically diverse (this means the maximum available physical separation of synchronization equipment and cabling).

13.4.3.9. No timing loops shall be formed in any combination of primary and secondary facilities unless GTE utilizes such combinations in its network.

13.4.3.10. GTE shall continuously monitor the BITS for synchronization related failures or degradation to the extent GTE provides such monitoring to itself.

13.4.3.11. GTE shall continuously monitor all equipment transporting synchronization facilities for synchronization related failures or degradation to the extent GTE provides such monitoring to itself.

13.4.3.12. For non-SONET equipment, GTE shall provide synchronization facilities which, at a minimum, comply with the standards set forth in ANSI T1.101-1994.

For SONET equipment, GTE shall provide synchronization facilities that have time deviation (TDEV) for integration times greater than 0.05 seconds and less than or equal to 10 seconds, that is less than or equal to 10 nanoseconds. TDEV, in nanoseconds, for integration times greater than 10 seconds and less than 1000 seconds, shall be less than 3.1623 times the square-root of the integration time. For example, for integration times of 25 seconds, TDEV shall be less than 15.8 nanoseconds.

13.5. **SS7 Network Interconnection**

13.5.1. Definition:
SS7 Network Interconnection is the Interconnection of GTE Signal Transfer Points (STPs) with AT&T STPs or AT&T local or tandem switching systems, for the purpose of providing local exchange or exchange access services. This connectivity enables the exchange of SS7 messages between AT&T local or tandem switching systems and GTE's local or tandem switching systems, and between AT&T local or tandem switching systems and other third-party local or tandem switching systems with signaling

connectivity to the same STPs. This connectivity also enables the exchange of messages between AT&T local or tandem switching systems, and GTE call-related databases.

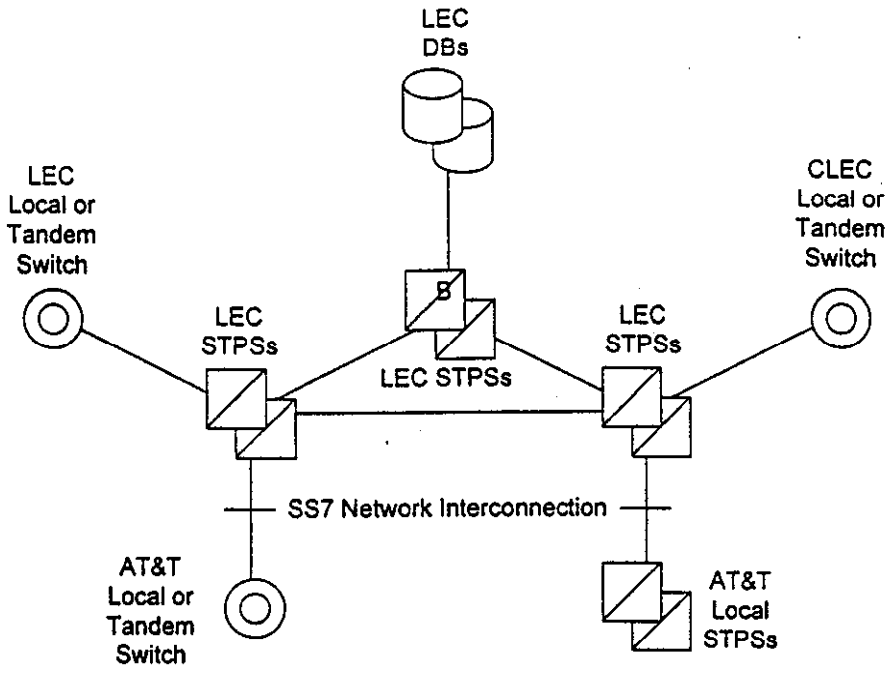


Figure 3. SS7 Network Interconnection

13.5.2. Technical References (subject to Section 23.19 of the General Terms and Conditions of this Agreement): GTE shall provide SS7 Network Interconnection at the same level of quality as GTE provides for such network interconnection in its own network. For example:

13.5.2.1. SS7 Network Interconnection provides connectivity to all components of the GTE SS7 network. These include:

13.5.2.1.1. GTE local or tandem switching systems;

13.5.2.1.2. GTE DBs; and

13.5.2.1.3. Other third-party local or tandem switching systems.

13.5.2.2. The connectivity provided by SS7 Network Interconnection fully supports the functions of GTE switching systems and DBs and AT&T or other third-party switching systems with A-link access to the GTE SS7 network.

13.5.2.3. In particular Figure 4 depicts a circumstance where SS7 Network Interconnection provides transport for certain types of Transaction Capabilities Application Part (TCAP) messages. If traffic is routed based on dialed or translated digits between an AT&T local switching system and a GTE or other third-party local switching system, either directly or via a GTE tandem switching system, then GTE SS7 network conveys via SS7 Network Interconnection the TCAP messages that are necessary to provide Call Management services (Automatic Callback, Automatic Recall, and Screening List Editing) between the AT&T local STPSs and the GTE or other third-party local switch.

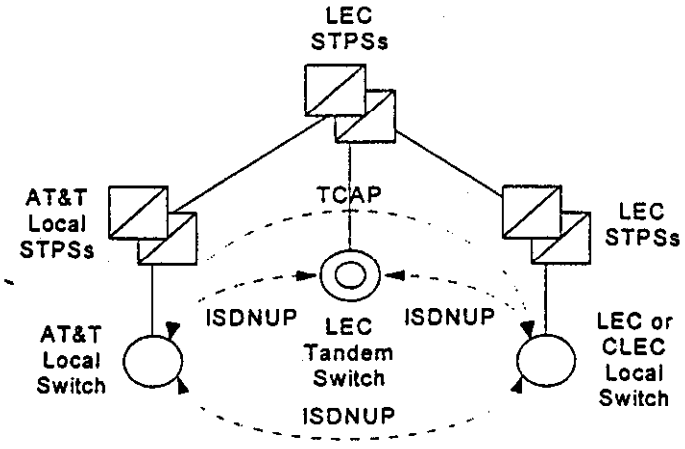


Figure 4. Interswitch TCAP Signaling for SS7 Network Interconnection

13.5.2.4. When the capability to route messages based on Intermediate Signaling Network Identifier (ISNI) is generally available on GTE STPSs, the GTE SS7 Network also conveys TCAP messages using SS7 Network Interconnection in similar circumstances where the GTE switch routes traffic based on a Carrier Identification Code (CIC).

13.5.2.5. SS7 Network Interconnection shall provide all functions of the MTP as specified in ANSI T1.111. This includes Signaling Data Link functions, as specified in ANSI T1.111.2; Signaling Link functions, as specified in ANSI T1.111.3; and Signaling Network Management functions, as specified in ANSI T1.111.4.

13.5.2.6. SS7 Network Interconnection shall provide all functions of the SCCP necessary for Class 0 (basic connectionless) service, as specified in ANSI T1.112 (Reference 13.5.2.5). In particular, this includes Global Title Translation (GTT) and SCCP Management procedures, as specified in T1.112.4. Where the destination signaling point is a GTE switching system or DB, or is another third-party local or tandem switching system directly connected to the GTE SS7 network, SS7 Network Interconnection shall include final GTT of messages to the destination and SCCP Subsystem Management of the destination. Where the destination signaling point is an AT&T local or tandem switching system, SS7 Network Interconnection shall include intermediate GTT of messages to a gateway pair of AT&T local STPSs, and shall not include SCCP Subsystem Management of the destination.

13.5.2.7. SS7 Network Interconnection shall provide all functions of the Integrated Services Digital Network User Part (ISDNUP), as specified in ANSI T1.113 (Reference 13.5.2.5).

13.5.2.8. SS7 Network Interconnection shall provide all functions of the TCAP, as specified in ANSI T1.114 (Reference 13.5.2.5).

13.5.2.9. If and when Internetwork MTP Routing Verification Test (MRVT) and SCCP Routing Verification Test (SRVT) become approved ANSI standards and available capabilities of GTE STPSs, SS7 Network Interconnection shall provide these functions of the OMAP.

13.5.3. Link Interface References (subject to Section 23.19 of the General Terms and Conditions of this Agreement):

13.5.3.1. GTE shall offer the following SS7 Network Interconnection options to connect AT&T or AT&T-designated local or tandem switching systems or STPSs to the GTE SS7 network:

13.5.3.1.1. A-link interface from AT&T local or tandem switching systems; and

13.5.3.1.2. D-link interface from AT&T STPSs.

13.5.3.2. Subject to Section 23.19 of the General Terms and Conditions of this Agreement, each interface shall be provided by one or more sets (layers) of signaling links, as follows:

13.5.3.2.1. An A-link layer shall consist of two links, as depicted in Figure 5.

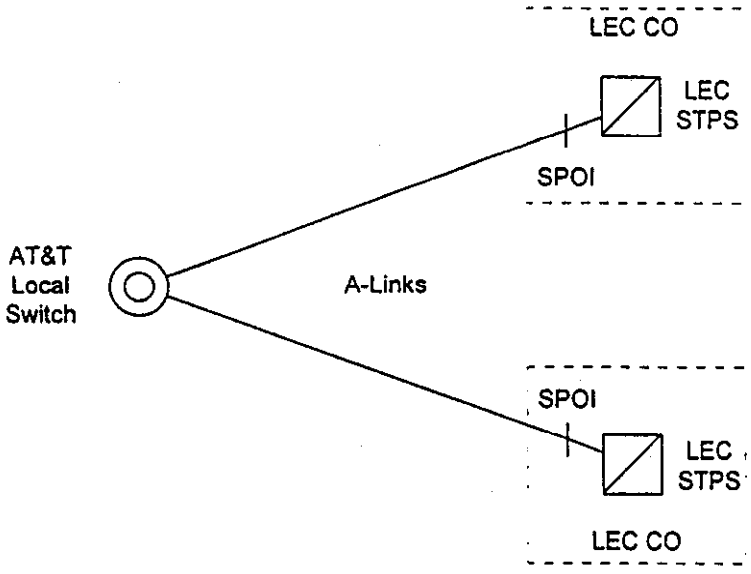


Figure 5. A-Link Interface

13.5.3.2.2. A D-link layer shall consist of four links, as depicted in Figure 6.

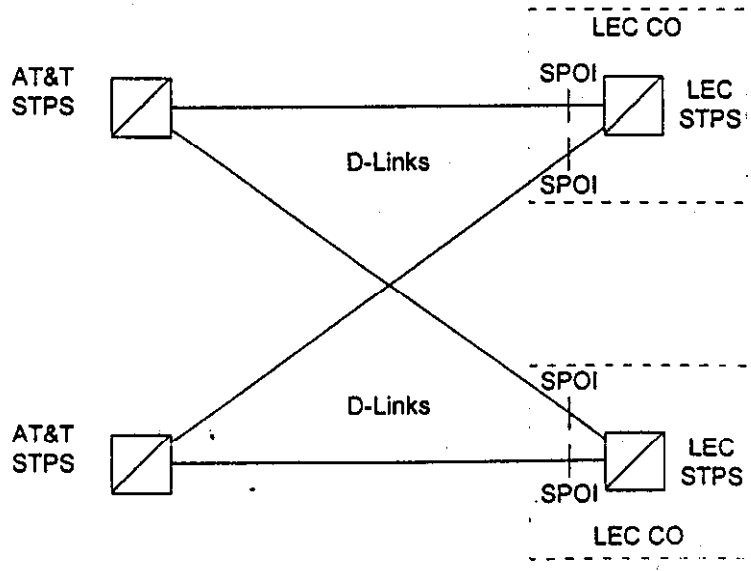


Figure 6. D-Link Interface

13.5.3.3. The Signaling Point of Interconnection (SPOI) for each link shall be located at a cross-connect element, (e.g., a DCS, DSX-1, etc.), in the Central Office (CO) where the GTE STPs are located. There shall be a 56kbps or higher rate transport interface at each of the SPOIs located in a GTE CO. Each signaling link shall appear as a DS0 channel within the DS1 or higher rate interface. GTE shall offer higher rate DS1 signaling links for interconnecting AT&T local switching systems or STPs with GTE STPs as soon as these become approved ANSI standards and available capabilities of GTE STPs.

13.5.3.4. To the extent GTE provides such capability to itself, its Affiliates or its subsidiaries in the particular GTE office, GTE shall provide intraoffice diversity between the SPOIs and the GTE STPs in that office, so that no single failure of intraoffice facilities or equipment shall cause the failure of both D-links in a layer connecting to a GTE STP.

13.5.3.5. The protocol interfaces for SS7 Network Interconnection include the MTP, ISDNUP, SCCP, and TCAP. These protocol interfaces shall, subject to Section 23.19 of the General Terms and Conditions of this Agreement, conform to the specifications contained in the technical references listed in Appendix A to this Attachment 2, under paragraph 14.

13.5.3.6. SS7 Network Interconnection shall be provided to AT&T in accordance with the technical references listed in Appendix A to this Attachment 2, under paragraph 15.

14. Unused Transmission Media

14.1. Definitions:

14.1.1. Unused Transmission Media is physical inter-office transmission media (e.g., optical fiber, from an LGX in one central office to another LGX in another central office, copper twisted pairs from the MDF of one central office to the MDF in another central office, coaxial cable) which has no lightwave or electronic transmission equipment terminated to such media to operationalize its transmission capabilities. This media may exist in aerial or underground structure or within a building.

14.1.2. Dark Fiber, one type of unused transmission media, is unused strands of optical fiber. Dark Fiber also includes strands of optical fiber existing in aerial or underground structure which

have lightwave repeater (regenerator or optical amplifier) equipment interspliced to it at appropriate distances, but which has no line terminating elements terminated to such strands to operationalize its transmission capabilities.

14.1.3. GTE is not responsible for the end-to-end performance in those applications where AT&T is utilizing unused transmission media.

14.2. Requirements

14.2.1. GTE shall make available, for lease by AT&T, its dark fiber in the feeder segment of GTE's loops and, when AT&T has collocation space in a GTE tandem or end office, in the dedicated interoffice transport segment of GTE's network, subject to the conditions and requirements set forth in sections 14.2.2 through 14.3.2.

14.2.1.1. AT&T will bear the cost of extending dark fiber in the feeder segment of GTE's network to AT&T end-user premises or AT&T's facility access locations within the loop access network.

14.2.2. GTE shall provide a Single Point of Contact (SPOC) for negotiating all Unused Transmission Media lease agreements.

14.2.3. AT&T may test the quality of the Unused Transmission Media to confirm its usability and performance specifications. AT&T may only test from its point of physical collocation, AT&T's end-user premises or AT&T's facility access locations at which AT&T has access to such unused Transmission Media. For virtual collocation applications, GTE will perform test(s) on the dark fiber as requested by AT&T and provide the results of the test(s) to AT&T, at AT&T's expense. Should such test results not meet AT&T specifications, GTE will only be obligated to perform those maintenance activities it would have performed for itself.

14.2.4. Upon receipt of a bona fide request, GTE shall provide to AT&T information regarding the location, availability of Unused Transmission Media within twenty (20) business days after receiving a request for a specific location from AT&T.

14.2.5. GTE shall make Unused Transmission Media available to AT&T within twenty (20) business days after it receives written confirmation from AT&T that the Unused Transmission Media

previously deemed available by GTE is wanted for use by AT&T at the price established by the Commission. If a written confirmation is not received from AT&T within thirty (30) business days after verification of availability, GTE may make such Unused Transmission Media available for its own use or, may make it available to another requesting party.

14.2.6. In leasing loop feeder dark fiber and dedicated interoffice dark fiber to AT&T, GTE will allocate its dark fiber capacity among requesting CLECs on a first-come, first-served basis and in a competitively neutral manner. GTE lease agreements for such fiber may provide that they are revocable upon twelve months' notice by GTE, provided that, in order to exercise its right of revocation, GTE must demonstrate that the subject fiber is needed to meet GTE's bandwidth requirements or the bandwidth requirements of another LSP. In addition, if GTE can demonstrate within a twelve month period after the date of a dark fiber lease that AT&T is using the leased capacity at a transmission level less than OC-12 (622.08 million bits per second), GTE may revoke the lease agreement. Whenever GTE revokes a dark fiber lease agreement under this section 14.2.6, it will provide AT&T a reasonable and sufficient alternative means of transporting the traffic.

14.2.7. GTE is not required to make available for lease by AT&T more than twenty-five percent (25%) of its Unused Transmission Media or dark fiber capacity in a particular feeder or dedicated interoffice transport segment.

14.3. Requirements Specific to Dark Fiber

14.3.1. AT&T will provide sufficient fiber cable from their LGX located in their physical collocation space to allow GTE personnel to terminate the GTE LGX. Where AT&T is obtaining access to dark fiber through virtual collocation, AT&T will provide the appropriate electronic equipment to terminate the fiber and GTE will provide the cross connection of the fiber to AT&T's equipment at AT&T's expense.

14.3.2. In those applications where AT&T requests optical regenerators, such regeneration will be provided by GTE on a case by case basis with additional costs to be borne by AT&T. However, in all events, AT&T may provide its own optical regenerators within AT&T's physical/virtual collocation space.

[Unused Transmission Media]